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THE ORIGIN OF LIFE

BY

RALPH E. BLOUNT
INSTRUCTOR IN PHYSIOLOGY, ROBERT WALLER HIGH SCHOOL, CHICAGO, ILL.

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THE ORIGIN OF LIFE.

CHAPTER ONE.

THE ORIGIN OF PLANT AND ANIMAL CHILDREN.

I. PLANTS AND LOWER ANIMALS.

In this lesson we shall aim to answer the question: How do new beings come into existence? People once thought that in fermenting or decaying substances certain minute living forms came into existence spontaneously; that is, that live things were produced just by the process of decay. But the microscope has revealed to us the details of the life of the tiny beings that exist in decaying things, and we now know that these lowly forms, as well as the plants and animals of more complex structure, come from preceding living beings of the same kind. Life comes only from life.

The living substance of every plant or animal resembles the raw white of egg. It is called protoplasm. It exists in tiny specks or sacks called cells. These cells, together with the few substances that lie between them, compose the bodies of all plants and animals. The word "animal" includes all species, from the microscopic forms which live in the water to the highest and most complex, man. The number of such cells in one person is almost beyond imagination. In one joint of the finger there are perhaps 100,000,000, possibly twice that number. Yet all the cells of various kinds and unimaginable number, composing the body of any plant or animal, came into existence by a process of growth from the protoplasm of a single cell. The methods of that process are the first things we shall study.

ASEXUAL REPRODUCTION.

In the tiny plants and animals composed of single cells, and also in many living forms composed of a multitude of cells, there is a very simple method of reproduction called asexual (*a* means *not*). In the scum which forms at the surface of a dish of water in which something is decaying, great numbers of one-celled animals may be seen with a microscope. Some one of these tiny beings may have a notch or groove around its middle, as though an invisible belt were drawn too tight. Watch it for half an hour or less—the groove gets deeper, till the two parts of the cell are held together only by a thread of protoplasm. When this breaks the two parts swim away as two independent beings.

In some forms, for example green mold and black mold, the parent cell breaks up into many specks of protoplasm, called spores (the dust of the mold), each of which may grow into a new form like the parent. Ferns and mosses and, in fact, nearly all plants of the lower kinds, reproduce by means of spores. It is a method of very rapid increase.

The yeast we put into bread dough is composed of small cells. A projection called a bud forms at the side of the cell. It grows till it becomes nearly as large as the parent, when it breaks off and becomes a new individual. Reproduction by budding is very common also among animals of the lower groups (coral, moss-like animals, etc.), but in these cases the bud at the side of the animal is composed of many cells. Most plants can be artificially multiplied by slips and buds, and many of them naturally have buds which drop off and form new individuals.

In asexual reproduction the offspring is just like the parent, is simply a part of the parent's body which has been separated from it and acquired an individuality of its own.

SEXUAL REPRODUCTION.

Sexual reproduction is a complex process, in contrast to the simple asexual method, and the new feature, which makes it so different from the asexual process, has deep meaning and far reaching influence.

This form of reproduction is found in all the great divisions of the plant and animal world from the lowest to the highest, and is the only form possessed by the higher animals. In this form, two cells from different parts of the same individual, or from different individuals, combine to form one cell, which grows into a new plant or animal, as the case may be. This offspring is different from either parent, since it includes some of the characteristics of both. The two cells which combine to produce the new individual are in some cases ordinary growing cells, but usually they are special cells set apart for this particular purpose. These two cells commonly differ greatly in size. The smaller is called the spermatozoön (plural, spermatozoa), the larger, the egg cell or ovum. Animals usually produce egg cells in considerable (sometimes very large) numbers, and sperm cells (spermatozoa) by the myriad.

Oysters, clams, lobsters, and some other animals that live in the water retain the egg cells within the body or fastened to the body. Fish usually lay theirs on the sand. Nearly all the water animals freely discharge into the water around them the spermatozoa they produce, which are very small and have at one end of the cell a thread of protoplasm which lashes back and forth and so drives the cell through the water. This movement is to bring the spermatozoön to one of the eggs. The spermatozoa spread about through the water without aim or guidance, but when some of them by chance come near an egg, an attractive force guides them into it, and one combines with the egg nucleus. The spermatozoön is said to fertilize the egg, for without this union the egg does not develop.

FERTILIZATION IN FLOWERS.

In flowers the pollen grain (commonly a yellow dust) is a minute body from which grows the sperm cell. The egg cell is within the pistil, the part which becomes the pod when the eggs develop into seeds. From the pollen a long tube grows down through the pistil until it reaches the ovule (little egg), where the protoplasm of the sperm cell joins that of the egg cell. The fertilized egg cell remains in the pistil, receiving nourishment from the plant's food, and growing into a seed—which is a young plant with stored-up food, ready under favorable conditions to sprout and grow.

The blossom and honey of the flower serve to attract insects, which by chance rub against the pollen of one flower and frequently carry it adhering to their rough bodies to another flower of the same kind. There it may rub off on the sticky end of the pistil and fertilize the egg cell. The pollen of some flowers fertilizes the egg cell of the same individual, but in most plants there are devices by which this is prevented, and the carrying of pollen from one flower to others of the same kind is insured. Egg cells fertilized by pollen from the same flower are said to be "close fertilized." If the pollen comes from a different flower of the same kind, the egg cells are said to be "cross fertilized." Cross-fertilization gives stronger plants, and so it is the method most favored in Nature.

In all the higher animals, and in many plants and lower animals, cross-fertilization is made necessary by the fact that the sperm cells and the egg cells grow in separate individuals. The male animal produces the sperm cell, and the female animal the egg cell. These two cells must be brought together for fertilization to take place. We have seen that in flowers a common method of accomplishing this end is by enticing insects to carry the pollen. In most animals the opposite sexes have an instinct to seek each other.

HOW WATER ANIMALS FERTILIZE THEIR EGGS.

The process by which the two cells are brought together differs a great deal in different animals. Some water animals, like barnacles, live in colonies fastened to rock or shell foundations. Others, as clams and starfish, move about independently, but exist in large numbers in the same locality. The male of such animals simply discharge their spermatozoa into the water at the season when the eggs are ripe, and rely on some of them finding their way to the egg cells.

Some fish smooth off a place in the sand, or find under a stump a nook in which the female lays the eggs; then the male takes charge of the nest and deposits the spermatozoa—many millions. Most of the eggs are soon fertilized by the spermatozoa which are swimming about. Frogs fertilize their eggs in a way very similar to that of the fish, but the male frog deposits the spermatozoa on the eggs just as they are being laid in the water, thus making their fertilization more nearly certain.

HOW LAND ANIMALS FERTILIZE THEIR EGGS.

Obviously the land animals cannot discharge their spermatozoa aimlessly, with any probability of their reaching the goal, the egg cells. They must employ another method. In all the higher animals and in many of the lower, such as insects, the male introduces the spermatozoa into a sack in the female's body prepared to receive them. The bee, and some other insects, can hold the spermatozoa in this sack for many months, and as she lays her eggs the spermatozoa fertilize them. In the higher animals the spermatozoa are actively lashing their threads of protoplasm even before they enter the receiving sack of the female, and they continue this movement as long as they live, driving themselves here and there, some working up the passage down which the egg is to come, till finally one reaches the egg and fertilizes it.

GROWTH IN THE EGG.

The fertilized egg cell must grow to produce the young animal, and must, therefore, be supplied with food. What we call the egg is commonly the egg cell surrounded by its food material, and all is enclosed in a shell. Occasionally it is the egg cell alone. If the young animal has, when it is little grown, the power of getting its own food, the egg is comparatively small, and the young is hatched small and poorly developed. Insects and frogs are examples of this kind. If, on the other hand, the young animal must be well developed before it is prepared to come out of the security of the shell, the egg is large, containing a great quantity of food material. Give examples of such animals. Do they lay comparatively few or many eggs? Some fishes lay hundreds of thousands of eggs each season.

Animals somewhat higher in development, e. g., birds and reptiles, produce fewer and larger eggs, and take better care of them. Such animals also feed and care for their offspring. The young animal, or embryo, growing within the egg, needs to breathe as well as to take food, and the oxygen or air it breathes cannot be stored up within the egg. The oxygen must be brought continuously into the egg from the outside. If the embryo is very small, the oxygen of the atmosphere or in the water can penetrate to all parts of it and supply its needs, but in the larger embryos there must be a special organ for breathing, and a circulating blood to distribute the oxygen and food to all parts of the embryo's body.

While the bird embryo is still very small it develops a membrane or thin skin filled with blood vessels, which soon spreads over the inner surface of the shell. Through the porous shell the gases pass, oxygen coming into the embryo's blood, and carbon dioxid, the waste gas, going out. In this way this membrane acts as a gill or lung.

II. MAMMALS.

We are now prepared to study reproduction in the highest group of animals, the mammals, those which nourish their young with milk. We have seen that sexual reproduction is superior to asexual in bringing variety and vigor to the cell. We have noted the value of cross-fertilization, the many devices for securing it, and the sureness of it when the egg cells and the sperm cells are produced in individuals of different sex. We have discussed the methods of fertilizing the ovum, and the provisions Nature makes for maintaining the life of the embryo. It now remains to see how these principles are applied in detail in the highest animals.

THE MALE FUNCTION.

The function or work of the male is to produce and bring to the female the spermatozoa, and to aid in protecting and feeding her and the offspring. The spermatozoa are produced in a pair of organs called testes. The testes consist mainly of many coiled tubes whose lining cells produce the spermatozoa. The protoplasm of one of these cells divides into several cells, each one of which becomes a spermatozoön. The spermatozoa are set free in the tube, which carries them to a complicated set of ducts (carrying tubes) through which they are discharged. The main duct from each side of the body opens into the urethra, the tube through which the urine is removed from the body.

Though the spermatozoa leave the testes by thousands, they are so tiny that they, and the fluid which floats them, make a very small quantity. To make a mass large enough to be forcibly discharged, fluid is added by secreting glands along the route. These fluids with the spermatozoa compose what is known as the semen. The spermatozoa make the vital part of the semen. The accompanying fluids, besides increasing the quantity of the liquid, provide a protective surrounding in which the delicate spermatozoa can live for a considerable time. Around the sperm ducts and the urethra are fibers of involuntary muscle whose contraction drives out the semen.

THE FEMALE FUNCTION.

The female function is to produce the egg cell, to provide for the embryo growing from it the conditions necessary for its life, and after birth to nourish the young till it is able to take ordinary food. The egg cells are produced in the ovaries, a pair of small organs situated in the pelvic cavity. The cells mature (become ripe) about once a month; in the highest mammals only one or two at the same period.

On maturity, the egg cells break through the membrane covering the ovary, and are received into the open end of the Fallopian tubes. These tubes, one on each side of the body, are lined with cilia (small threads of protoplasm projecting from the cell), which by their wavelike motion convey the eggs to the uterus, a sack with muscular walls, lying in the middle of the pelvis. A small opening leads from the uterus to the vagina. The semen from the male is received into the vagina. The thousands of spermatozoa, moving blindly about, swarm over the moist lining of the vagina and uterus. Many of them work up the Fallopian tubes, ready to meet the egg when it leaves the ovary.

If the egg is fertilized, it lodges in the uterus and grows. This process is called conception. Since only one of the thousands of spermatozoa is needed to fertilize the egg, conception will probably occur if any sperm cells are present. If the egg is not fertilized, it remains only a short time in the uterus and is then discharged.

EMBRYO LIFE.

Reptiles and birds produce comparatively large eggs, which contain food sufficient to support the embryo till it is developed enough to take the food of the adult. Mammals produce very small eggs, scarcely visible to the naked eye, and retain them within the uterus till the embryo is grown and ready for birth. The developing embryo of mammals must be nourished from the mother's blood. The fertilized egg sends out little projections (villi) which fasten to the lining of the uterus and absorb from it their nourishment. Some of these villi after a while shrink up, while the remainder, together with the lining membrane to which they cling, develop into the placenta, a large pad in which the blood vessels of the embryo come in contact with those of the mother. Thus the blood of the young is able to receive from the mother, through the thin membrane of these blood vessels, the food and oxygen necessary for the embryo, and to give off to the mother's blood its wastes.

As the embryo enlarges, the uterus grows to accommodate it, and the muscles in its walls increase in preparation for the work they have to do at the birth of the child. For it is by the contraction of the uterine muscles that the young is finally expelled from its first warm nest into the cold world.

While the foetus (embryo) is developing, the milk glands or mammae, are also growing, that the food may be ready when it is needed. A day or two after the birth of the young, milk forms in the mammae, and the instinct of sucking stimulates the young to seek its food. Henceforth the care of the young is not simply the automatic working of unseen bodily functions; it involves the conscious actions of nursing and protection, controlled by the faithful parental instincts.

CHAPTER TWO.

SAFEGUARDING THE SEX LIFE.

THE GROWING AGE—ADOLESCENCE.

Matters of sex are so fundamental in our relations with one another that the life of a boy or a girl, as well as that of a man or a woman, may be filled with blessing by keeping this function wholesome; or it may be blasted almost beyond healing by the abuse or wanton use of this sacred power.

During childhood sex plays a relatively small part in life, but at puberty (the age at which the coarse hairs, pubes, first appear in the armpits and groins, usually between the thirteenth and seventeenth year) a great change comes over the boy and the girl. The sex organs, which have been small and inactive, take on a sudden growth. The undeveloped cells of the ovary become periodically mature eggs and are cast off. The uterus enlarges. The testes begin to produce spermatozoa, and the other secreting glands to secrete their fluids. The whole body feels the new life. Brawn and bone are in evidence. Grace of form appears.

The mind, too, undergoes a revolution. The boy and the girl are no longer the simple comrades in work and companions in play that they were. She is invested with charms and attractions hitherto unperceived: and he is clothed with new might and virtues in her eyes. Proud of their new powers, boys and girls sometimes think that now they are grown up, ready for the new life as men and women. But the human stock matures slowly: there still lack six or eight years before the powers of sex are fully ripe. To anticipate their full development, as is done in very early marriage, is a serious mistake.

The strength and beauty of the adolescent growth is caused by the development of the sex organs. As the ovaries in girls become larger at puberty they begin to secrete a substance which is absorbed by the blood and carried to all parts of the body. This substance stimulates the rapid growth characteristic of this age, and moulds the awkward girl into a beautiful womanly form. It also acts on the brain and causes the mind to develop its characteristic traits. Without this secretion by the ovaries the perfect woman does not develop.

In the boy there is a corresponding secretion by the testes. When this is absorbed and carried throughout the body, it causes the growth of the manly frame and inspires the courageous spirit. Without this secretion the body and mind do not acquire their full vigor. It is, therefore, of the utmost importance that these secreting reproductive organs be kept in perfect health.

SELF-ABUSE.

The external sex organs of little children sometimes have some slight defect, such as the skin's growing fast where it should be free; or the urine or some other secretion produces an irritation and causes the child to rub or scratch the organs. The trouble can usually be remedied by a physician, and should be promptly cared for, since otherwise the child may get accustomed to exciting the sex organs and contract a most vicious habit. Whether such a habit, called masturbation, is thus established, because of an irritating defect of the organs, or whether the boy or girl deliberately stimulates them for the sake of the sensation, it is an exceedingly harmful practice. To irritate the nerves of the sex organs idly or wantonly is to degrade to a vulgar use a passion which has an exalted function in conjugal life; it is a serious offense against oneself; it takes away one's self-respect, and makes one a coward before others. The young man or the young woman who persists in this sin becomes a moral and physical wreck, with a pale, trembling, hysterical body, and a ruined mind. In extreme cases, physical collapse and insanity may result. It is possible for anyone who has fallen into the vicious habit of self-abuse to escape this horrible outcome. A determined effort and a hard fight usually win the day. Sometimes the coöperation of a physician is almost indispensable. Normal health and strength are usually quickly recovered after the evil practice is stopped.

A VAMPIRE—THE ADVERTISING "DOCTOR."

Young men are often victims of charlatans, or so-called "doctors," and quack remedies. Advertisements appear in the newspapers describing symptoms of the sex diseases that are said to lead to serious debility, loss of manhood, etc. The claim is made that the trouble can easily be cured by the medicine or by the charlatan advertised. The young man who reads is convinced that he is in a dangerous condition; he feels timid about consulting the family physician, so he goes to the "specialist." These advertising "doctors" are generally scoundrels, who delude the youth into taking medicine he does not need. If anything is wrong with the sexual functions of a young man he should consult the most trustworthy physician he can get—the one who attends other members of his family.

Boys should know that voluptuous dreams, accompanied by seminal emissions, are normal, the experience of all young men, and not the grave symptoms of departing virility. The reproductive glands in health are always producing a small amount of fluid, part of which is absorbed again, part escapes with the urine, and part is lost in occasional night emissions. The amount that is lost is small and does no harm unless the boy has been indulging unclean thoughts or practices. The boy who keeps his mind occupied with worthy things has nothing to fear.

MENSTRUATION.

Young women experience from puberty, about the fourteenth year, the periodic discharge of blood from the uterus, known as menstruation. It recurs at periods of about twenty-eight days, and in health lasts from three to five days. The bleeding is caused by some of the lining cells of the uterus breaking down and exposing the very small blood vessels, which are easily ruptured. The muscular contractions of the uterus check the bleeding, and new cells soon replace those broken down. The purpose of this function may be to prepare a fresh surface for the attachment of the egg. Although a mature egg may be discharged from the uterus at other times, this process (ovulation) usually occurs just before, during, or just after menstruation. Hence it is that conception usually occurs at this time. If a girl is normal, she should be able to continue during the period her usual work, but should avoid any unusual strain or fatigue. Wet feet or chilling should be guarded against. Exercise is desirable, but should be somewhat moderated. Clothing should be loose and easy; and the pressure of all stays, bands or straps, straight fronts, and hip reducers is more than ever harmful at this time. If a girl would bear this function easily and later become a good mother, she must be a good animal; she must do more walking, running, rowing, swimming, and play more open air games than is customary with girls. Menstruation should be painless, but since we are such imperfect specimens of our race, especially under modern city conditions, it often is not. The suffering can often be made less and sometimes completely relieved. Girls should promptly consult a trustworthy physician (in most cities there are competent women physicians), and not wait till painful menstruation has become a fixed habit. They should never resort to patent medicines, some of which are merely worthless, while others contain alcohol and other drugs which work great injury to the body.

VENEREAL DISEASES.

The immoral relations of men and women have spread throughout the land the germs of several diseases to which the term venereal is applied. Though the germs which cause them may be communicated in many ways—by public towels and drinking cups, by a kiss, by public closets, etc.—they are commonly conveyed from one person to another through sexual relations. Comparatively few people outside the medical profession know how widespread these diseases are, what terrible suffering they produce, and what ravages they make in the vigor of the human race.

One of the venereal diseases, gonorrhea, was once thought to be comparatively harmless. It is now known to be one of the worst scourges of mankind. In fact, some reliable authorities think that it produces, in Europe and America, more sickness and death than any other disease—except possibly tuberculosis.

In the male organs the germs of this disease get into the urinary and seminal passages, producing pus, whose discharge spreads the contagion. They sometimes produce very painful inflammations, and not infrequently deformities that last through life and seriously interfere with the necessary functions of the body.

In the female organs gonorrhea does much more damage. The germs find easy passage through the uterus and Fallopian tubes to the deeper parts of the body. In the tubes and uterus they flourish, producing painful inflammation, and generating quantities of poisonous pus. Many severe surgical operations on women are made necessary by gonorrheal germs. They, more than any other cause, render women incapable of bearing children. In many cases, also, they render men incapable of becoming fathers. A very large per cent of blindness is caused by gonorrheal sore eyes in new-born babes. The germs from the infected mother get into the infant's eyes at birth, and unless the inflammation resulting is promptly and efficiently treated, it is likely to produce blindness. A young man may harbor the germs in his body for months or even years, ready to contaminate the bride who trusts him. A girl risks her life in marrying a man who has not been pure in conduct. The disease just discussed is so widespread, and the innocent have been made to suffer so cruelly from it, that legislators are endeavoring to enact laws that will afford protection to those who suffer through no fault of their own, laws permitting marriage to those only who are physically fit.

Another disease, syphilis, has been more dreaded than gonorrhea, because its symptoms are more revolting and its effects are more far reaching; but it is not so widespread as gonorrhea, and does not produce so much suffering and death. The germs of this disease spread in the blood all through the body. The skin is disfigured with eruptions. Large sores difficult to heal often develop, and unless proper treatment is persistently applied for months or years, the body may succumb.

Children produced while either parent is suffering from syphilis usually contract the disease and die either before they are born or during infancy. If they live they are often deformed and produce either weak children or none. Children of parents who have recovered from syphilis, though sometimes strong, often bear the effects of the disease—small, fragile teeth, deficient bone growth, and general lack of vigor. The sins of the fathers are visited upon the children. Syphilis is more likely than gonorrhea to be communicated through other means than sex relations. In a community where syphilis is common, as it is in all our large cities, we must cautiously guard our bodies from contamination. At school or on the railway train have your own drinking cup, if there is no sanitary fountain. Use your own comb and brush, and avoid the public roller towel. In public closets take great care that your skin does not come in contact with surfaces that may have been contaminated by diseased persons. Our boards of health, backed by suitable laws, are doing good service in guarding us against smallpox, yellow fever, and most other contagions, but people suffering from venereal diseases go unchecked, spreading their contagion to all, and in most states neither statute nor officer of the law attempts to restrain them.

CHAPTER THREE.

MORAL CONSIDERATIONS.

THE RIGHT TO BE WELL BORN.

Men and women these days are being deeply stirred by a sense of responsibility for posterity. We must see that those who come after us are not deprived, through our wasteful ways, of the materials necessary for their wellbeing—forests, minerals, etc. The permanent structures we erect, the governments and philanthropic and educational institutions we establish, which are changed with such difficulty, should be so planned as to benefit our descendants for many generations. But most of all should we be concerned that our offspring themselves have splendid bodies and noble minds. "To pass on the torch of life not only undimmed, but ever brighter from generation to generation, is the highest service which parents of any generation can possibly render."

While this sense of duty to posterity is arousing the best people of our time, the human stock in civilized countries, and especially in large cities, is surely and not slowly deteriorating. Insanity in the United States increases six fold, while the population doubles. Deafmutism is on the increase, as are also epilepsy, alcoholism, and nervous exhaustion. The torch is being dimmed. How? Those in whom the light of life shines less brightly are producing children, handing their dim light on to the next generation, in which it will become still fainter. For it is the law of life that weak parents produce still weaker children. Salvation to the race can come only by checking reproduction in the weak, and stimulating it in the strong.

During the last few years much has been learned about the laws of heredity. It seems as though at last we were established on a sound scientific foundation. By the diligent application of these discoveries we are making wonderful strides in the improvement of cultivated plants and domestic animals. The hope arises that, if we give study and devotion to the production and rearing of children, we can in time bring forth a race of nobler men and women. Such a result is worthy of the utmost endeavor, and can be produced only by a thorough consecration to wholesome, ideal living, a consecration such as is shown in conforming to a religious duty.

The work for eugenics (well born) takes a negative and a positive aspect. Negatively our endeavor will be to prevent the propagation of the undesirable. People having transmissible defects should not marry. In this case are the congenitally deaf and dumb, most of the deformed, the epileptic, the weak minded, those with insanity in the family, those having grave incurable nervous disorders, habitual drunkards and drug fiends, the syphilitic, those suffering from lead poisoning or tuberculosis.

Our prisons, reformatories, almshouses, and asylums for defectives are largely recruited from the families of such people. State laws are doing something to prevent the marriage of these unfit. But the laws are not enough. The human race cannot give off its brightest ray until a high sense of responsibility is awakened in its younger members, as guardians of the "torch of life." Those unable to hand on the torch undimmed must voluntarily, for the sake of the race, lay aside all thought of matrimony. Marriage should not always follow where love points the way. Renunciation may sometimes be the highest duty of love.

Concerning the positive aspect of eugenics, there is little to say. With regard to the human race the study is just beginning. We do know, however, that the strong body and active mind of the parent are inherited by the offspring. It should add immensely to the interest and conscientiousness with which we care for ourselves, to know that we are providing not only for our own wellbeing, but also for our children and our children's children. There can be no more worthy consecration for a young man or a young woman than this—to keep himself or herself pure, to train the body to be strong, the mind to be whole, that he may be a worthy father or she a worthy mother of the better race that is to be.

CONCLUSION.

We have tried to explain clearly the physiology of reproduction, because we think boys and girls ought to understand the subject; they have a right to know themselves. We have called attention to the particular evils that follow the wrong use of the sexual function, and the horrible diseases that are sweeping the land as a result of immorality, to the end that you may know something of the enormity of the disaster, and not through ignorance become a victim.

Now, in closing we shall try to set before you an ideal that will help you make your life the best possible. Common animals feel sexual attraction to their mates only at certain seasons or periods. Then they respond to their instincts without restraint. Adult mankind is not entirely limited to seasons, but may at any time feel sexual desire, and needs to control his actions by his reason rather than by his instincts. The more progressive parts of the human race have been for centuries growing toward the ideal of monogamy, one man and one woman married for life. No community has yet perfectly attained the ideal. But every boy and girl should firmly resolve to let nothing turn him aside from this high aim. The young man expects a pure girl for his bride; the young woman should accept only a chaste man as her suitor. Fair play is a virtue we value highly. We despise a sneak who tries to get from others what he is not willing to give in return. Only a low down fellow would come smutched and tarnished to a bride whom he requires to be pure and true. From the time a child is able to understand the meaning of marriage, he should cherish his purity for the one who may in future years join him in wedlock.

If a boy or a girl should be so reckless as not to care for the sanctity of his own person, let him remember that the stain of sin is not on himself alone. He always drags another into the mire with him. How can one be so lost to the welfare of his fellows as willfully to ruin the life of a companion? The normal and proper function of the sex organs is the production of a child. To indulge the sex function in spite of this almost certain result is not only to wrong oneself and one's partner in sin, but also to fix the disgrace of illegitimate birth on an innocent child. The relation of parenthood, which under proper conditions brings great joy, becomes a blight on the lives of those it should bless.

Some young men have the notion that they need, for their most complete physical development, to have occasional sex relation with women. Nothing could be farther from the truth. Perfect health is in keeping with perfect continence. In athletic training continence is the strict rule. It is considered one of the conditions necessary to the highest physical vigor. Men come to their marriage in the best sexual state if they have lived chaste lives.

The bodily union of men and women ought never to be the simple gratification of physical passion: it should come as the most intense expression of a love so devoted that the lovers are ready to give up their lives for each other, or to spend all their years in unselfish service of one another. This ideal of the relation of the sexes should be in the background of the daily life of boys and girls—always there, controlling the actions, requiring courtesy to others and respect of self, but not brought to notice. In fact, to meditate on the bodily relation detracts from the high quality of the love of husband and wife that is to come. Settle the matter once for all that you will keep yourself fit for the marriage relation by living a chaste life, then put the matter out of your attention and give your thoughts to the cultivation of those qualities which will make you worthy of esteem and love.

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